

EVALUATION OF THE FISH COMMUNITY AND WALLEYE STOCKINGS  
AT CAGLE'S MILL RESERVOIR

Owen and Putnam Counties

2004 Fish Management Report

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## EXECUTIVE SUMMARY

- Cagle's Mill Reservoir, which is also known as Cataract Lake, is a 1,400-acre Army Corps of Engineers impoundment.
- Largemouth bass were sampled one night a week for three consecutive weeks between April 19 and May 5, 2004. The overall CPUE of largemouth was 92.8/h. Nearly 27% of all the largemouth bass sampled were 14 in or larger.
- A fish community survey was conducted May 10 to 20, 2004.
- A total of 6,005 fish that weighed nearly 2,065 lbs was collected. Twenty-four species and hybrid sunfish comprised the sample.
- Gizzard shad was by far the most abundant species collected by number (61%) and weight (36%).
- Bluegill abundance by number (8%) and weight (4%) were similar to 2000. While a much greater percentage of bluegill in the present survey (55%) were considered harvestable size (at least 6 in) than in 2000 (25%), just 1% measured at least 8 in.
- White bass up to 15.3 in long were sampled and the average size was 7.2 in. The 2003 year class accounted for approximately 68% of the white bass collected.
- Crappie up to 14.3 in long were collected. Most (89%) of the crappie collected in 2004 were age 1 and ranged in length from 4 to 6 in.
- A total of 172 channel catfish that weighed over 435 lbs was collected. Channels up to 31.7 in long were collected and the average size was 16.7 in.
- Largemouth bass abundance by number remained low (2% versus 1% in 2000). Much like in 2000 when 25% of the bass measured at least 14 in long, 26% of the largemouth in the present survey were 14 in or longer.
- During the community survey, walleye from 7.8 to 26.7 in long were collected while the average was 13.4 in.
- A fall walleye evaluation was conducted October 20, and 25 to 28, 2004.
- A total of 122 walleye was collected during the fall evaluation that weighed 163 lbs. Walleye ranged in length from 6.1 to 26.6 in and averaged 13.4 in. Excluding young-of-the-year (YOY), 80% of the walleye measured at least 14 in.
- The next fall evaluation is slated for 2006 and the next community survey is scheduled for 2009.

- Future consideration will be given to stocking muskie.

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## INTRODUCTION

Cagle's Mill Reservoir, which is also known as Cataract Lake, is a 1,400-acre Army Corps of Engineers impoundment. The lake is located approximately 7 mi southwest of Cloverdale, Indiana. Much of the land around Cagle's Mill is under the jurisdiction of two state properties, Lieber State Recreation Area (LSRA) and Cataract Falls State Recreation Area. State owned boat launches are located in LSRA and near the town of Cunot.

Walleye stockings began at Cagle's Mill in 1972 but were discontinued in the late 1970's due to poor survival, low harvest, and a lack of suitable forage. Following the introduction of gizzard shad in the mid 1980's, walleye stockings resumed. From 1994 to 2000, the annual stocking goal was 4.2 million walleye fry (3,000 per acre). Following the 2000 fall evaluation it was recommended to reduce the annual walleye stocking to 2.8 million fry (2,000 per acre) because growth had slowed, indicating the population may have reached peak abundance (Keller 2001). In both 2001 and 2002, 2.8 million walleye fry were stocked. Surplus walleye fry were available the last two years, which led to stockings of 4.3 million fry in 2003 and 3.5 million in 2004.

The last fish community survey was conducted in 2000. Gizzard shad was by far the dominant species found. Game species that were well represented in the survey included bluegill, crappie, channel catfish, white bass, and largemouth bass. Fair portions of all game fish collected were of harvestable or quality size.

The present survey was conducted to evaluate the fish community at Cagle's Mill Reservoir. Early spring largemouth bass sampling was conducted to provide additional information about the bass fishery. A fall evaluation of walleye was also conducted. Success of the 2004 walleye stocking and survival and growth of previously stocked walleye were evaluated.

## METHODS

### LARGEMOUTH BASS SAMPLING

Largemouth bass were sampled one night a week for three consecutive weeks between April 19 and May 5, 2004. Two hours of DC electrofishing were conducted each night for a total of 6 h of sampling (24, 15-min stations). Overall, approximately 22% of the shoreline was

sampled.

Largemouth were the primary target of the sampling, however, smallmouth bass were also collected. Bass were measured to the nearest 0.1 in TL and scales were taken for age and growth analysis. Weights of the fish were estimated using central Indiana averages.

## FISH COMMUNITY SURVEY

The fish community survey was conducted May 10 to 20, 2004. Physical and chemical characteristics of the lake were measured on the first day according to Division of Fish and Wildlife (DFW) survey guidelines (Shipman 2001).

Fish were collected via 2.25 h (9, 15-min stations) of DC electrofishing at night, 17 gill net lifts, and eight trap net lifts. Collected fish were measured to the nearest 0.1 in TL. Scale samples were taken from the dominant sport fish and gizzard shad for age and growth analysis. No scales were taken from largemouth bass since sufficient scales were collected during spring bass sampling. Weight estimates of all species were calculated using central Indiana averages, if available, or length-weight regression. Proportional stock density was figured for bluegill and largemouth bass (Anderson and Neumann 1996). The Bluegill Fishing Potential Index (BGFP) was also used to describe the bluegill fishery (Ball and Tousignant 1996).

## FALL WALLEYE EVALUATION

The fall walleye evaluation was conducted October 20, and 25 to 28, 2004. Survey effort consisted of 3.5 h (14, 15-min stations) of DC electrofishing at night and 18 gill net lifts. Electrofishing and net set locations duplicated those of previous fall evaluations. All collected walleye were measured to the nearest 0.1 in TL and weighed to the nearest 0.01 lb. Scales were taken for age and growth analysis.

## RESULTS

### LARGEMOUTH BASS SAMPLING

The water temperature was 60°F on the first two nights of sampling (April 19 and 26) and 62°F on the third night (May 5). Like water temperature, pool elevation and outflow from Cagle's Mill were fairly stable throughout bass sampling (US Army Corps of Engineers 2006). The lake level was 636.1 ft and the outflow was 102 cfs on April 19, while on May 5, the

measurements were 636.7 ft and 53 cfs.

Over the course of the three nights, 557 largemouth bass were collected. The overall CPUE of largemouth was 92.8/h. Catch rates of the individual nights were 125.5 largemouth bass/h on the first night, 63.5/h on the second night, and 89.5/h on the last night. Over 49% of all the largemouth and the majority (59%) of the 14-in and larger bass were collected from just five of the twenty-four stations sampled. Four of those stations were sampled on the first night which accounted for the higher catch rate.

Largemouth bass ranged in length from 3.4 to 20.3 in and averaged 11.6 in. Bass that met or exceeded the 14-in minimum size limit constituted anywhere from 15% of the collection on the second night to 34% of the sample on the last night. In the end, nearly 27% of all the largemouth bass sampled were 14 in or larger. The PSD for largemouth was 63. Similar to 2000, largemouth bass at Cagle's Mill exhibited well above average growth compared to other central Indiana largemouth populations.

Just three smallmouth bass were collected. Two, one that measured 3.7 in and the other 11.6 in, were collected on the second night. The third was 11.5 in long and was sampled on the last night.

## FISH COMMUNITY SURVEY

The surface temperature of the main lake on May 10 was 73°F. Dissolved oxygen was greater than 5 ppm down to 30 ft. Conductivity was 350  $\mu$ S and the Secchi disk reading was nearly 3.5 ft. Over the course of the community survey, the lake level rose approximately 5.6 ft. However, nearly minimum outflow from the lake was maintained throughout.

A total of 6,005 fish that weighed nearly 2,065 lbs was collected. Twenty-four species and hybrid sunfish comprised the sample. Gizzard shad was by far the most abundant species collected by number (61%). Bluegill, white bass, white crappie, and longear sunfish were the only other species to account for at least 5% of the sample by number. Shad (36%), channel catfish (21%) and carp (18%) accounted for the greatest portion of the total weight.

The relative abundance of gizzard shad collected by both number (61%) and weight (36%) were less than they were in 2000, 74 and 48%, respectively. In the present survey, 3,680 shad were collected that weighed 741 lbs. The electrofishing CPUE of shad (1,195.1/h) was similar to that of 2000 (1,142.2/h). In 2004, shad ranged in length from 3.8 to 12.7 in and

averaged 8.3 in. Much like in 2000 when ages 2 and 3 shad accounted for over 98% of the total collected, at least 96% of the present sample was comprised of ages 2 and 3 fish and most (at least 81%) of these were 8.0 to 8.5 in long. Also like in 2000, age-1 shad accounted for just 1% of those collected. Gizzard shad grew slightly slower than normal and slower than those collected in 2000. On average, shad were 1 in smaller at age 2 and 2.1 in shorter at age 3 than those previously collected.

A total of 489 bluegill that weighed 74 lbs was collected. Bluegill abundance by number (8%) and weight (4%) were similar to 2000, 7 and 2%, respectively. Bluegill CPUE was 110.2/h of electrofishing. Bluegill measured 2.0 to 8.1 in long and averaged 5.7 in. While a greater percentage of bluegill in the present survey (55%) were considered harvestable size (at least 6 in) than in 2000 (25%), just 1% measured at least 8 in. Bluegill PSD was 23. As in 2000, bluegill demonstrated well above average growth to age 3. The BGFP score was 17 which corresponds to a “fair” rating for the bluegill fishery.

The 416 white bass collected weighed nearly 132 lbs. Since 2000, white bass increased in abundance by number from 2 to 7% and by weight from 3 to 6%. The 2003 year class accounted for approximately 68% of the white bass collected. Nearly all of the age-1 white bass were sampled via electrofishing while all but one of the age-2 and older fish were caught in gill nets. White bass up to 15.3 in long were sampled and the average size was 7.2 in. White bass exhibited average growth at age 1 and slightly better than average growth thereafter. However, growth was significantly slower than in 2000. The decline in growth between surveys ranged from 0.7 in at age 3 to 1.3 in at age 1.

Three hundred and seventy-three white crappie weighing 45 lbs were collected. White crappie abundance by number (6%) and weight (2%) were similar to 2000, 5 and 3%, respectively. Crappie up to 14.3 in long were collected. However, the average crappie measured just 5.7 in, which was a substantial decrease from 8.1 in in 2000. Most (89%) of the crappie collected in 2004 were age 1 and they ranged in length from 4 to 6 in. Similar to 2000, growth of crappie at age 1 was normal and age-2 and older fish exhibited slightly to well above average growth.

Fifth in abundance by number (5%) was longear sunfish. Overall, 296 longear were collected. As is usually the case with longear, only a small percentage (7%) measured at least 6 in long. The biggest longear collected was 7.0 in.



A total of 172 channel catfish that weighed over 425 lbs was collected. Channel catfish accounted for just 3% of the sample number, yet made up 21% of the weight. Channels up to 31.7 in long were collected and the average size was 16.7 in. There was a fairly even distribution of catfish between 7.5 and 29.5 in.

One hundred and thirty-five carp that weighed approximately 379 lbs were collected. Carp constituted 18% of the total collection by weight. Carp ranged in length from 8.0 to 27.7 in and the average length was 17.3 in.

There were 123 freshwater drum collected that weighed almost 66 lbs. The largest drum measured 16 in long. Fifteen percent of the drum were 12 in or longer.

A total of 116 largemouth bass weighing approximately 102 lbs was collected. The electrofishing CPUE of bass (47.6/h) was higher than in 2000 (33.8/h) but largemouth abundance by number remained low (2% versus 1% in 2000). Largemouth ranged in length from 3.9 to 17.3 in and averaged 11.3 in. Much like in 2000 when 25% of the bass measured at least 14 in long, 26% of the largemouth in the present survey were 14 in or longer. Bass PSD was 66.

Thirty-three walleye were sampled that weighed 45 lbs. Walleye from 7.8 to 26.7 in long were collected while the average was 13.4 in. Twenty-three of the walleye were age 1 and they were found up to 12 in. One 12.5-in age-2 walleye was collected. The nine remaining walleye were age 3 or older and measured at least 18.5 in.

Fourteen other species plus hybrid sunfish accounted for the rest of the sample. Collectively, these species represented just 3% of the sample by number and 1% by weight. Some of the species of interest to anglers included warmouth, black crappie, redear sunfish, smallmouth bass, and black and brown bullheads.

## FALL WALLEYE EVALUATION

A total of 122 walleye was collected that weighed 162.57 lbs. Walleye ranged in length from 6.1 to 26.6 in and averaged 13.4 in. Overall, 48% of the walleye were 14 in or larger. Excluding YOY, 80% of the walleye measured at least 14 in.

Forty-eight YOY walleye were collected and all were caught via electrofishing (13.7/h). This was substantially lower than both the 2003 YOY catch rate (45.0/h) and the average fall YOY catch rate at Cagle's Mill from 1990 to 2003 (49.1/h) (Keller 2004). In the present survey, YOY from 6.1 to 10.1 in long were captured and on average measured 7.9 in. This was smaller

than in both 2002 and 2003 when YOY averaged 8.1 and 9.1 in, respectively.

Seventy-four age-1 and older walleye were collected and most (82%) were sampled in gillnets (3.4/lift). The gillnet CPUE of age-1 and older walleye in fall evaluations at Cagle's Mill between 1990 and 2003 was 5.1/lift. The 2003 year class accounted for 59% of the age-1 and older fish and over a third of all the walleye collected. Age-1 walleye up to 17.5 in long were found. Only four age-2 walleye were sampled, of which the largest was 19.5 in. The remaining walleye collected were age 3 and older. Walleye collected in the community and fall surveys exhibited slightly above average growth at age 1 and average growth at ages 2 and 3. On average, walleye were smaller at age 2 (1.5 in less) and age 3 (1.9 in) than in 2000.

## DISCUSSION

In many respects the fish community at Cagle's Mill Reservoir looked much the same as it did in 2000. Gizzard shad was again by far the dominant species collected. Like in 2000, it is possible that shad may have been over-sampled in proportion to the other species because at the time of the survey it appeared that shad were spawning. Adult shad (age-2 and older) congregate in shallow water to spawn (Pflieger 1997) which makes them much more susceptible to capture, especially via electrofishing. This may have been a contributing factor as to why such a large percentage (at least 96%) of the shad collected were two and three year olds. In 2000, it was suspected that shad were spawning during that survey and the age 2 and 3-year classes accounted for 98% of the shad collected.

Few changes were detected in the bluegill and largemouth bass fisheries. The abundance of both species was again fairly low, especially largemouth. Fortunately, because of the continued good growth of both species, harvestable size fish once again accounted for a considerable number of the bluegill and bass collected. Over half the bluegill were 6 to 8 in long and over a quarter of the bass measured at least 14 in.

White bass and white crappie both tend to be cyclic species. They routinely fluctuate between periods of high abundance and small average size, and periods of low abundance and large average size. In the recent survey, white bass and crappie appeared to be at or moving towards peak abundance. A large percentage of white bass collected were age 1 (68%), and their growth slowed as a likely result of increased competition caused by their increasing abundance. While white crappie did not increase in abundance, the 2003 year class accounted for 89% of the

crappie sampled which caused a 2.4-in decrease in the average size crappie collected.

With nearly 14 YOY walleye collected per h of electrofishing, the 2004 stocking exceeded the DFW success criteria of 7 YOY per h. However, the YOY CPUE fell far short of the average CPUE in fall evaluations conducted at the reservoir since 1990 (49.1/h). CPUE and growth of YOY walleye tend to reflect spring and summer water levels. Increased water levels provide an influx of food for the young fish and more habitat for them to seek refuge from predation. The lake being at or near normal pool throughout much of 2004 (US Army Corps of Engineers 2006) likely contributed to the relatively low CPUE and small average size of YOY (7.9 in) in comparison to other years. By contrast, in 2003, the water level rose shortly after walleye were stocked and was high throughout much of that year which contributed to a fall CPUE of 45.0 YOY/h and an average size over 9 in.

In large part due to the number of walleye from the 2003 year class collected, age-1 and older walleye were fairly well represented in the recent fall evaluation. Many of these walleye were at least 14 in long despite a decline in the growth of walleye at ages 2 and 3 since 2000. To continue to try and promote better walleye growth through reduced competition, the stocking rate should remain at 2,000 fry per acre. This rate has shown to be capable of producing year classes that exceed the DFW success criteria and with elevated spring and summer water levels the potential for producing exceptional year classes exists. Given more time, the reduced stocking rate coupled with periodic high water years (which promote good growth) may eventually result in improved growth.

The next fall evaluation of walleye is scheduled for 2006. Stocking success and survival and growth of older walleye will be evaluated. The next fish community evaluation is slated for 2009.

Future consideration should be given to stocking muskie. In addition to shad there are a number of other non-sport fish in the reservoir that muskie could utilize as forage. In a setting such as Cagle's Mill where sport fish are not very abundant and forage is prevalent, additional predator stockings can help increase angling opportunities. Although current hatchery production is not enough to stock Cagle's Mill along with the other lakes on the stocking list, changes in the statewide muskie program may provide the opportunity for some fish in the future. In the meantime, more limnological information about the reservoir and more information pertaining to the water quality and habitat needs of muskie should be gathered. This

way if the opportunity arises to stock muskie an informed decision can be made.

## RECOMMENDATIONS

- The next fall evaluation should be conducted in 2006.
- The next fish community evaluation should be scheduled for 2009.
- Future consideration should be given to stocking muskie.

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